1. Using analytical methods calculate the following for the given set of tasks:

- Calculate the system hyperperiod: which value = Least Common Multiplier of all tasks periodicities:

  Button_1_PERIOD 50
  Button_2_PERIOD 50
  Transmitte_PERIOD 100
  Receive_PERIOD 20
  LOAD_1_PERIOD 10
  LOAD_2_PERIOD 100

  Hyperperiod=100

- Calculate the CPU load:

  -"button1_monitor" & "button2_monitor" tasks execution time: 14 uSec (2 Hyperperiod)
  -"periodic transmitter" task execution time: 18.8uSec (1 Hyperperiod)
  -"uart receiver" task execution time: 22.3 uSec (5 Hyperperiod)
  -"load1_simulator" and "load2_simulator" tasks execution time: 5 mSec (10 Hyperperiod) and 12 mSec (1 Hyperperiod)

  CPUL= ((14 µs * 2) *2 + 18.8 µs + 22.3 µs *5) + 5 ms *10 +12ms /100 ms)*100%

  =136 µs +50 ms+12ms /100 ms *100% = 62.136%

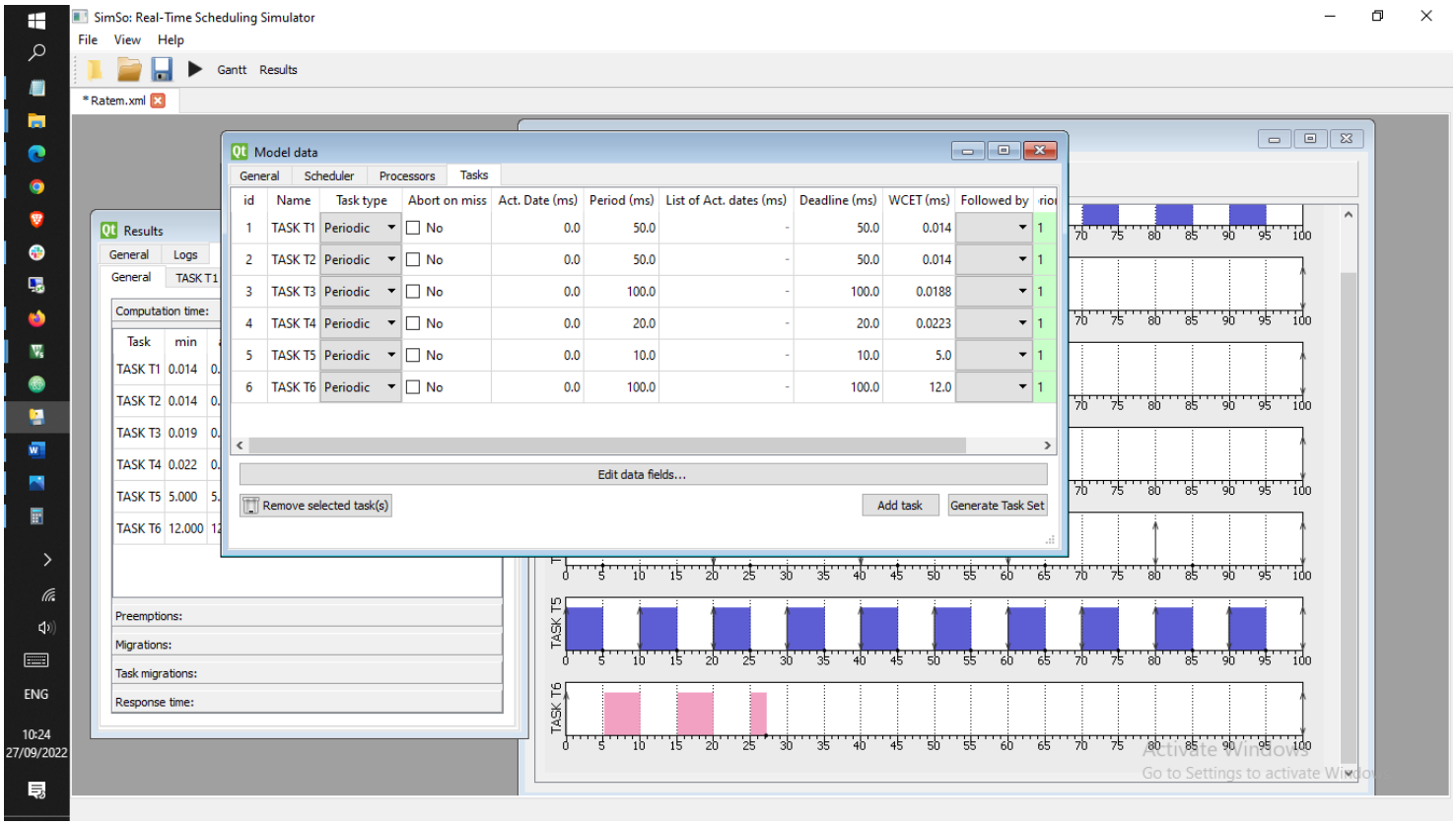
- Check system schedulability using URM and time demand analysis techniques (Assuming the given set of tasks are scheduled using a fixed priority rate -monotonic scheduler):

  $U \leq n[\ 2\ \hat{}(1/n) - 1]$, n=6 --> $U\mathrm{rm}=6(2\hat{}(1/6)\text{-}1) =0.734$

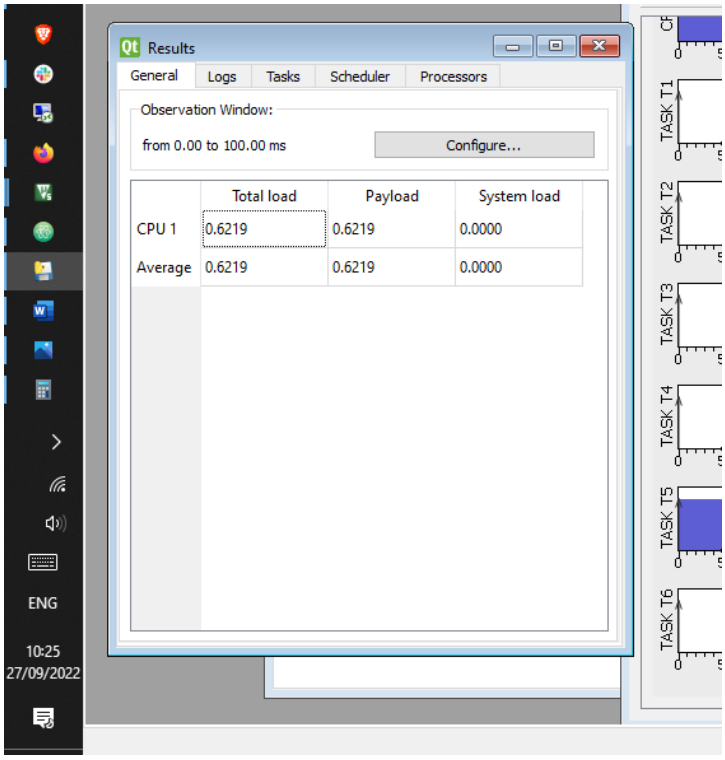
  U = ∑ Ci/Pi = 14 µs / 50 ms+14 µs / 50 ms+18.8 µs / 100 ms+ 22.3 µs/20 ms+5 ms /10 ms + 12 ms / 100 ms = 0.620748

  , Then U < $U\mathrm{rm}$ → it's **Schedulable** Systems.

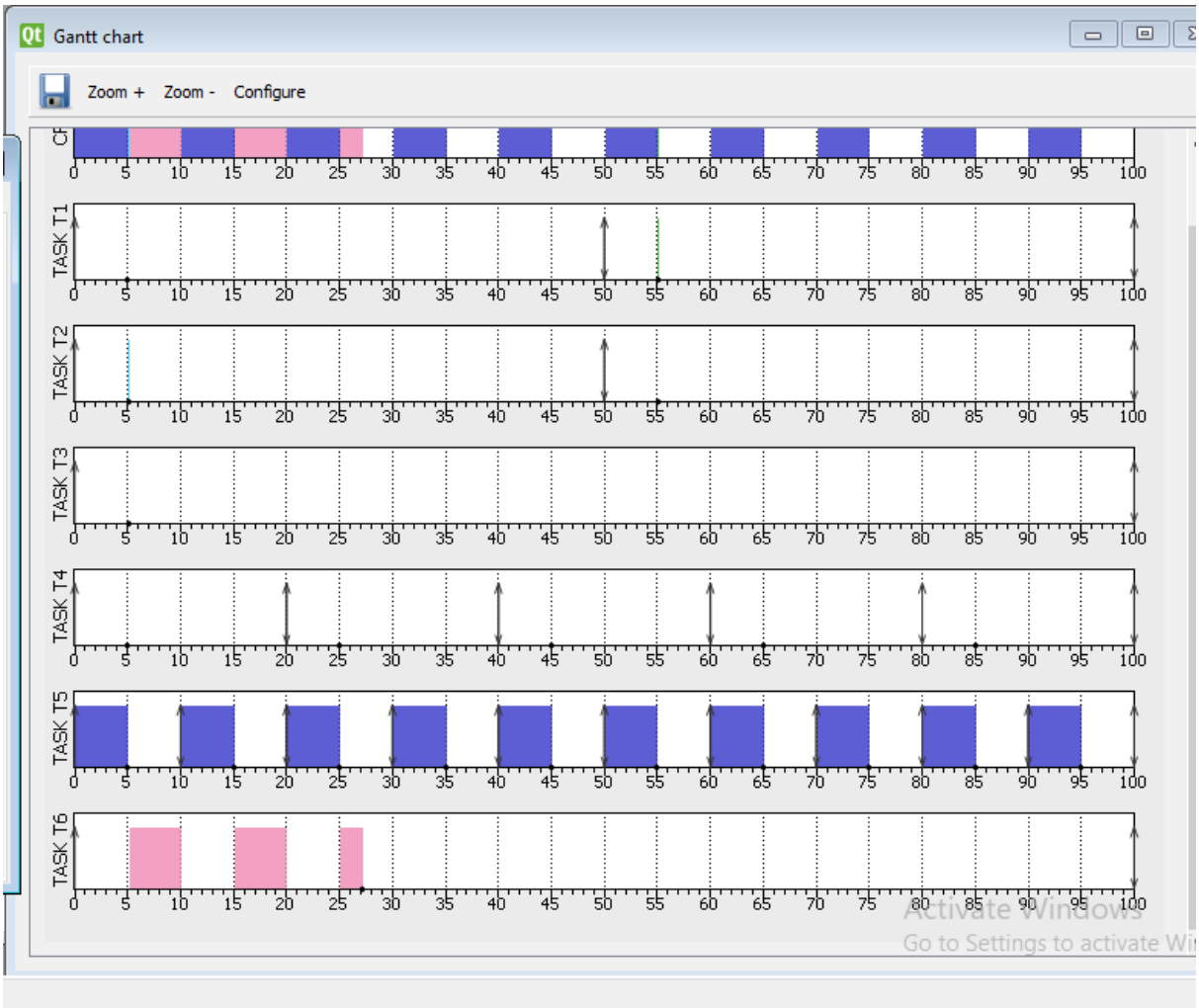
2. Using Simso offline simulator, simulate the given set of tasks assuming:



- CPU Load:



- Gantt chart



- CPU Load and Logic Analyzer

  The CPU load is 62% as showed, so the system is not too much loaded and worked successful.